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SURVEILLANCE REPORT

Invasive Pneumococcal Disease in Ontario: 2025

Published: July 2026

This report includes the most current information available from Ontario's Integrated Public Health Information System (iPHIS) as of **March 4, 2026**.

Introduction

This report describes the epidemiology of invasive pneumococcal disease (IPD) in Ontario in 2025, including case characteristics and case counts/incidence rates by age group and geography. Trends over time for the years 2007 to 2024 are also included. Further information on data sources and methods can be found in the technical notes section.

A confirmed case of IPD requires both clinical evidence of invasive disease (e.g., bacteremia, meningitis) and laboratory confirmation of infection from a normally sterile site (e.g., blood, cerebrospinal fluid).[1] Only IPD, the most severe presentation of *Streptococcus pneumoniae* infection, is a disease of public health significance, therefore less severe presentations (e.g. pneumonia without bacteremia, otitis media) are not captured in provincial surveillance. The majority of IPD cases result in hospitalization and occasionally death.

There are over 100 known serotypes of *Streptococcus pneumoniae*,[2] although about 30 of these serotypes are responsible for the majority of IPD in Ontario. Some *Streptococcus pneumoniae* serotypes are vaccine-preventable and there are three vaccines that protect against pneumococcal disease available in Ontario. Two vaccines are available through Ontario's publicly-funded routine immunization program: the 15-valent pneumococcal conjugate vaccine (PCV15) is delivered in three doses as part of the primary childhood series administered between 2 and 12 months of age; and the 20-valent pneumococcal conjugate vaccine (PCV20) is offered to all adults aged 65 and older as well as to people aged 2 and older considered to be at increased risk of IPD.[3] The third vaccine is the 21-valent pneumococcal conjugate vaccine (PCV21) which is available by prescription for private purchase. Information on pneumococcal immunization coverage and vaccine safety can be found in Public Health Ontario's Immunization Data Tool.[4]

Overview

- In 2025, there were 1,917 cases of IPD reported, with an annual incidence rate of 11.7 cases per 100,000 population (Figure 1). The 2025 case count and rate are the highest observed within the surveillance period of 2007-2025.
- Monthly case counts were above the five-year non-pandemic average plus two standard deviations in January, February and December (Figure 2).
- Most cases (92.6%) were among adults (aged 18 and older) (Table 1). All age group-specific rates for people aged 5 years and older are above the five-year non-pandemic average rate. The age group-specific rates for children in the <1 and 1-4 age groups are lower than the five-year non-pandemic average rate (Figure 3).
- Over 90% of IPD cases with identified serotypes (n=1,468/1,623) were vaccine-preventable (Table 2). The highest rates of IPD were due to shared PCV15/PCV20/PCV21 serotypes (Figure 4), and the individual serotypes with the highest rates in 2025 were 3, 22F, 9V, 4 and 12F (Figure 5).
- IPD cases were reported from all 29 public health units in Ontario. Among individual public health units, Toronto had the highest case count but a relatively low rate (Figure 6). The northwest and northeast regions had the highest regional rates (Figure 7).

Trends Over Time

- IPD case counts and rates have fluctuated during the surveillance period of 2007 to 2025. Annual incidence rates were generally rising between 2015 until 2020 and then drastically decreased when the COVID-19 pandemic began. The rates have been rising since 2023 (Figure 1).
  - Ontario had the lowest recorded case counts and rates during the height of the COVID-19 pandemic (2020-2021), with case counts and rates being particularly low for 2021 (n=655, 4.4 cases per 100,000 population).
  - The highest annual case count and rate was in 2025 with 1,917 cases and a rate of 11.7 per 100,000 population.
- In 2025, monthly case counts were above the five-year non-pandemic average for every month except for July, and above the five-year non-pandemic average plus two standard deviations for the months January, February and December (Figure 2).

Case Characteristics

- Males accounted for 1,067/1,917 (55.7%) of all cases in 2025 (Table 1).
- Cases ranged in age from under 7 days to 101 years with a median age of 62 years.
- Most cases (n=1,775; 92.6%) were in people aged 18 years and older. People in the 65+ age group had the highest number of cases with 815, representing 42.5% of all IPD cases reported (Table 1).
- The highest age group-specific rates in 2025 were among the oldest age groups (65+ and 50-64) and the youngest age groups (<5 year), which is consistent with previous years. Despite being high overall, the age group-specific rates for people under 5 were below the five-year non-pandemic average, while the 2025 rates were higher than the five-year non-pandemic average for all other age groups (Figure 3).

Severity

- A total of 55 cases (2.9%) had a documented ER visit without a hospital admission. Most of these cases were in the 18-49 year age group (n=35).
- Overall, 1,716 cases (89.5%) had a documented hospitalization (Table 1), of which 129 cases also had an intensive care unit (ICU) admission documented in iPHIS, including:
  - 1,585 hospitalized adult cases (aged 18 and older) with 124 ICU admissions.
  - 131 hospitalized pediatric cases (aged 17 and younger) with five ICU admissions among children aged 1 and older. Sixteen of these hospitalizations were in children under 1 year of age.
- In 2025, 183 (9.5% of cases) deaths were reported (Table 1).
  - 178 of the deaths occurred in adults over 18 years of age (range 21-101 years, median 67 years).
  - Two of the five pediatric deaths were in children <5 years of age.

Immunization Status

- Among the 1,917 cases in 2025, 595 (31.0%) were unimmunized, 245 cases (12.8%) were immunized (median two doses, range one to five doses), and 1,077 cases (56.2%) had an unknown immunization history (Table 1).
- Of the 245 previously immunized cases, 121 cases had received a product protecting against the serotype that caused their IPD. The median time since the last dose was five years (range 2.5 weeks-28 years). The most frequently infecting serotypes in this group were 3 (n=35), 4 (n=13), 9V (n=13) and 19F (n=13).

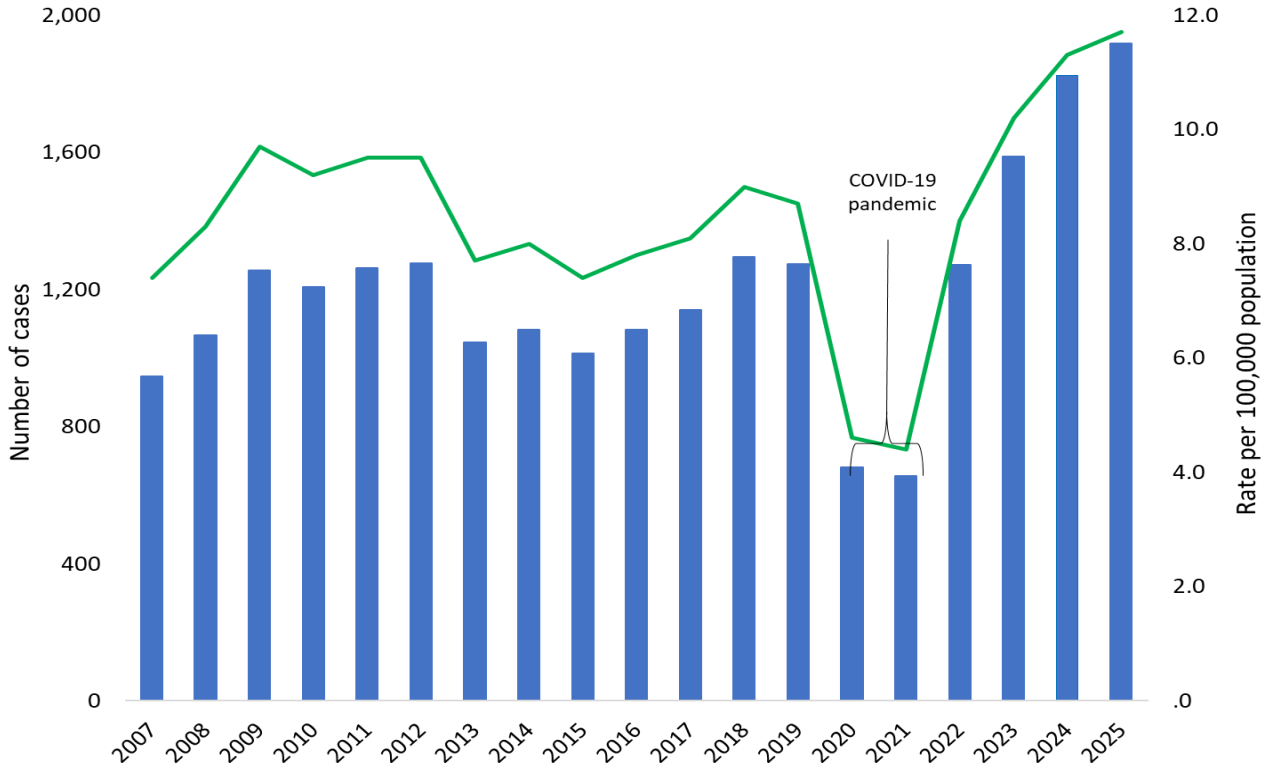
Serotype Distribution

- Among the 1,623 cases with an identified serotype, serotype 3 caused the majority of IPD, followed by serotypes 9V, 4, 12F and 22F (Figure 5). Of these, all except for serotype 22F are above the five-year non-pandemic average rate.
- Serotype distribution differs by age group. For example, children under 5 are more likely to be infected with PCV15-related serotypes, while adults aged 65 and older are more likely to be infected with PCV21-related serotypes (not shown).
- Over 90% of cases with identified serotypes (n=1,623) were vaccine-preventable. Most cases (28.2%) were due to serotypes shared across the PCV15/PCV20/PCV21 vaccines, followed by those shared in the PCV15/PCV20 vaccines (23.8%), unique PCV21 serotypes (19.8%) and shared PCV20/PCV21 serotypes (18.7%) (Table 2).
- Shared PCV15/PCV20/PCV21 serotypes have declined after peaking in 2010 but remain as the highest group in Ontario (Figure 4). Higher rates in this group are driven by serotype 3 which causes the most IPD cases of any known serotype in Ontario (Figure 5). Apart from the pandemic years (2020-2021), rates of unique PCV21 and shared PCV20/PCV21 serotypes have been generally rising throughout the surveillance period and shared PCV15/PCV20 serotypes have been increasing since 2017 (Figure 4).

Geography

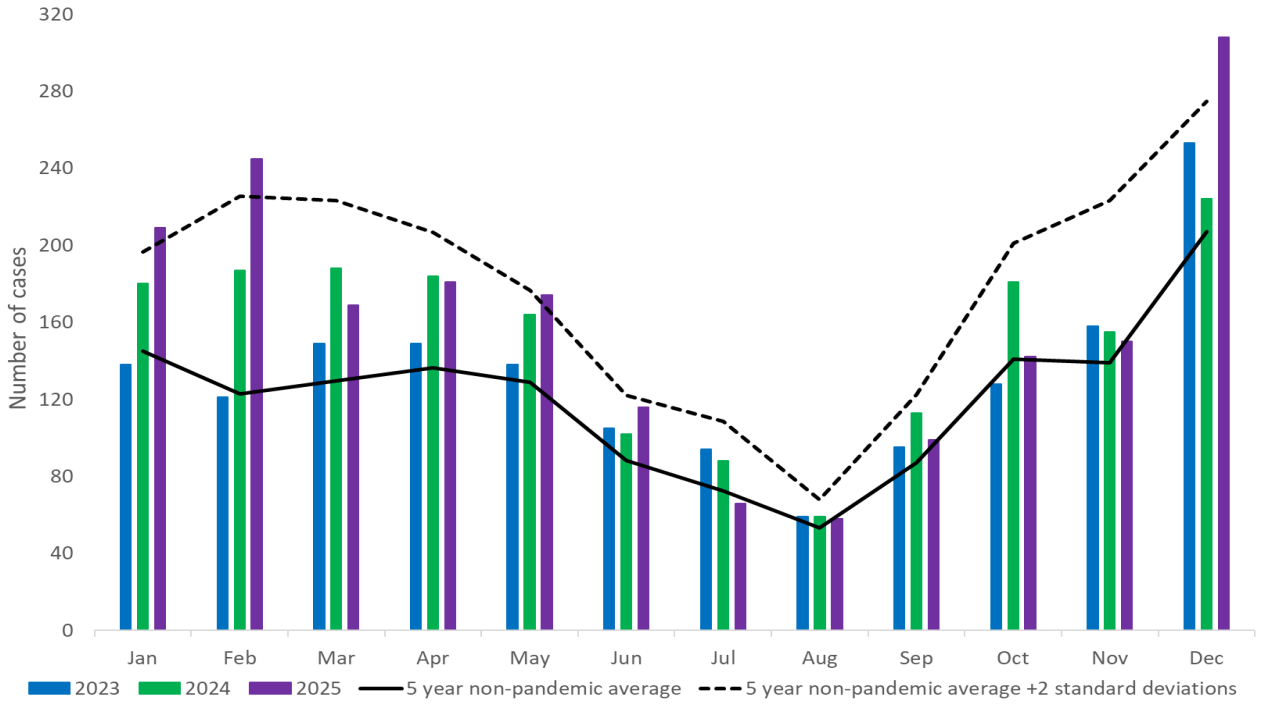
- Cases were reported from all 29 public health units (Figure 6).
- The Northwest and Northeast regions of Ontario have the highest case rates and the public health units with the six highest case rates are all located within these two northern regions (Figures 6 and 7).
- While Toronto was the public health unit with the highest number of cases in Ontario (n=287), it had one of the lowest observed rates (Figure 6).

Figure 1: IPD Case Counts and Incidence Rates per 100,000 Population: Ontario, 2007-2025



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Cases	946	1,066	1,256	1,206	1,262	1,276	1,045	1,083	1,013	1,083	1,141	1,294	1,275	682	655	1,272	1,587	1,825	1,917
Rate	7.4	8.3	9.7	9.2	9.5	9.5	7.7	8.0	7.4	7.8	8.1	9.0	8.7	4.6	4.4	8.4	10.2	11.3	11.7

Figure 2: Number of IPD Cases by Month: Ontario, 2023-2025 and Five-Year Non-Pandemic Average*



*For IPD, the 5 year non-pandemic average was based on the years 2018, 2019, 2022, 2023 & 2024.

Characteristics of IPD Cases: Ontario, 2025

Table 1A: Gender

Case Characteristics (n=1,917)	n	%
Female	848	44.2
Male	1,067	55.7
Other	2	0.1

Table 1B: Age

Case Characteristics (n=1,917)	n	%
<1 year	16	0.8
1-4 years	64	3.3
5-17 years	62	3.2
18-49 years	453	23.6
50-64 years	507	26.5
≥65 years	815	42.5

Table 1C: Hospitalizations

Case Characteristics (n=1,917)	n	%
Hospitalized (all cases)	1,716	89.5
<1 year	16	100.0
1-4 years	61	95.3
5-17 years	54	87.1
18-49 years	379	83.7
50-64 years	458	90.3
≥65 years	748	91.8

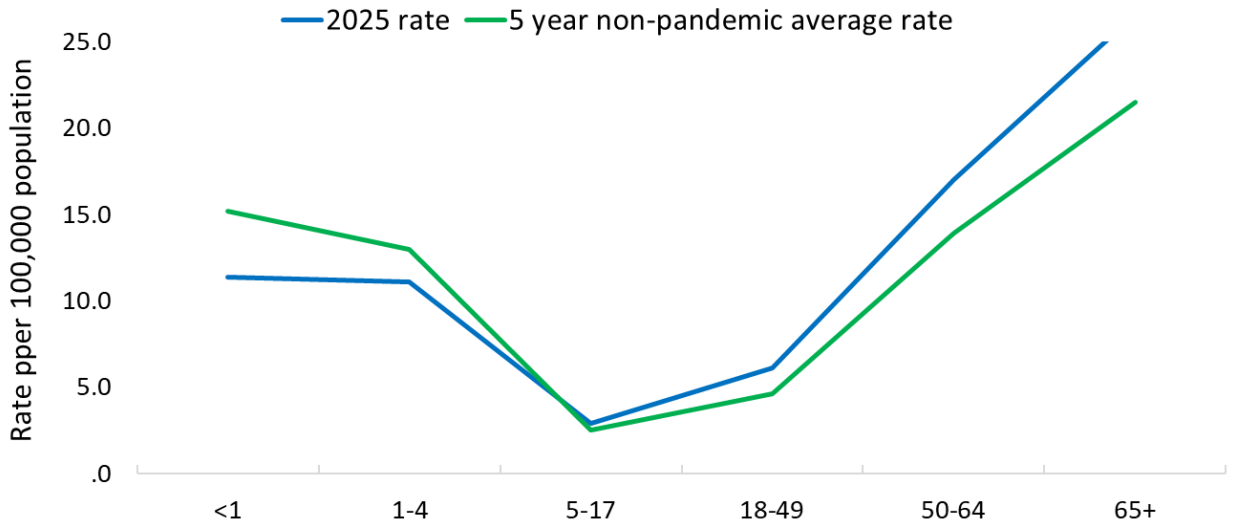
Table 1D: Deaths

Case Characteristics (n=1,917)	n	%
Deaths (all cases)	183	9.5
<1 year	1	6.3
1-4 years	1	1.6
5-17 years	3	4.8
18-49 years	26	5.7
50-64 years	40	7.9
≥65 years	112	13.7

Table 1E: Immunization Status

Case Characteristics (n=1,917)	n	%
Not documented (i.e., unknown)	1,077	56.2
Unimmunized	595	31.0
Immunized	245	12.8

Figure 3: IPD Rates by Age Group: Ontario, 2025



	<1	1-4	5-17	18-49	50-64	65+
2025 rate	11.4	11.1	2.9	6.1	17.0	26.6
5 year non-pandemic average rate	15.2	13.0	2.5	4.6	13.9	21.5

Table 2: Serotype Distribution* by Vaccine Coverage among IPD Cases: Ontario, 2025

Vaccine Serotype Coverage	n	%
Shared PCV15/PCV20/PCV21 serotypes (3,6A,7F,19A,22F,33F)	457	28.2
Shared PCV15/PCV20 serotypes (1,4,5,6B,9V,14,18C,19F,23F)	387	23.8
Shared PCV20/PCV21 serotypes (8,10A,11A,12F,15BC)	303	18.7
PCV21 unique serotypes (9N,15A,16F,17F,20A,23A,23B,24F,31,35B)	321	19.8
Not vaccine preventable	155	9.6
Total (cases with serotype results)	1,623	

*In 2025, 294 cases (15.3% of all cases) did not have a serotype result recorded in iPHIS

Figure 4: Rates of IPD by Vaccine Serotype Coverage: Ontario, 2007-2025

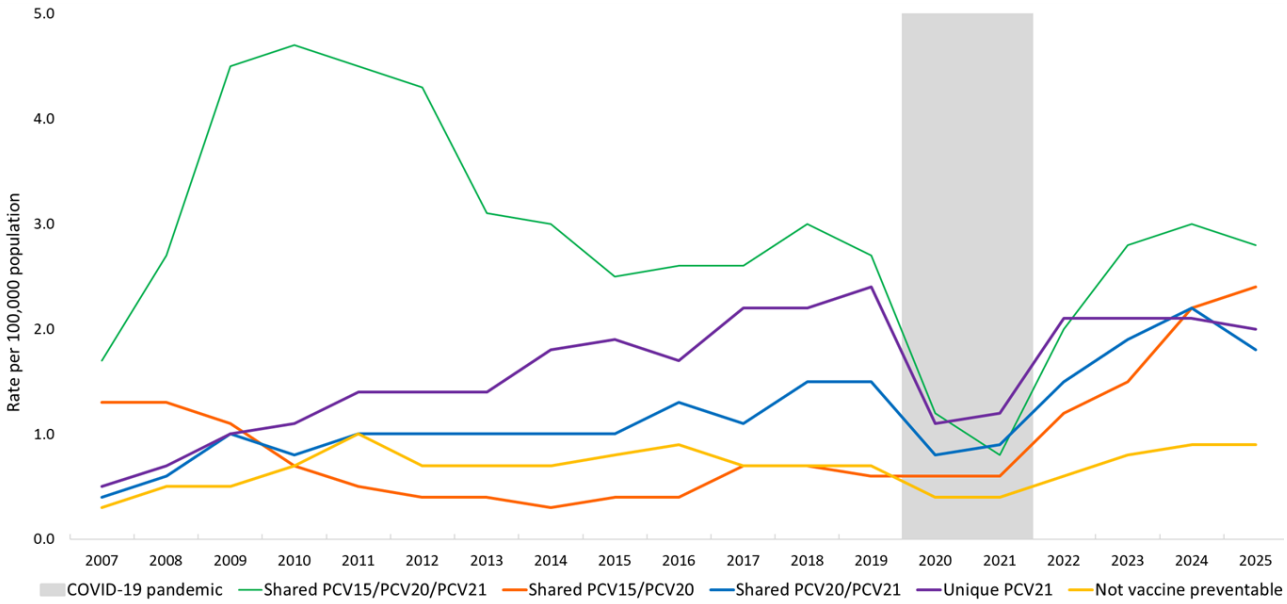
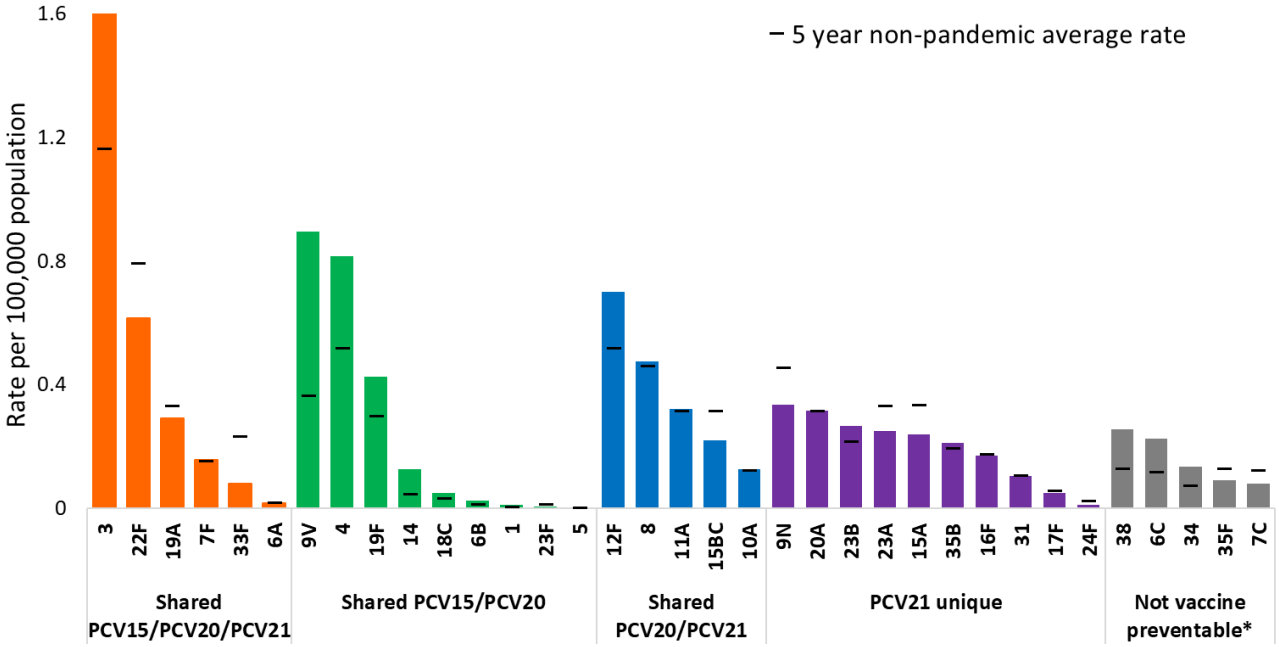


Figure 5: Serotype Distribution Rates by Vaccine Coverage and 5 Year Non-Pandemic Average Rates: Ontario, 2025



*Only the five highest individual rates among not vaccine preventable serotypes are shown

Figure 6: Region-Specific IPD Case Counts and Rates: Ontario, 2025

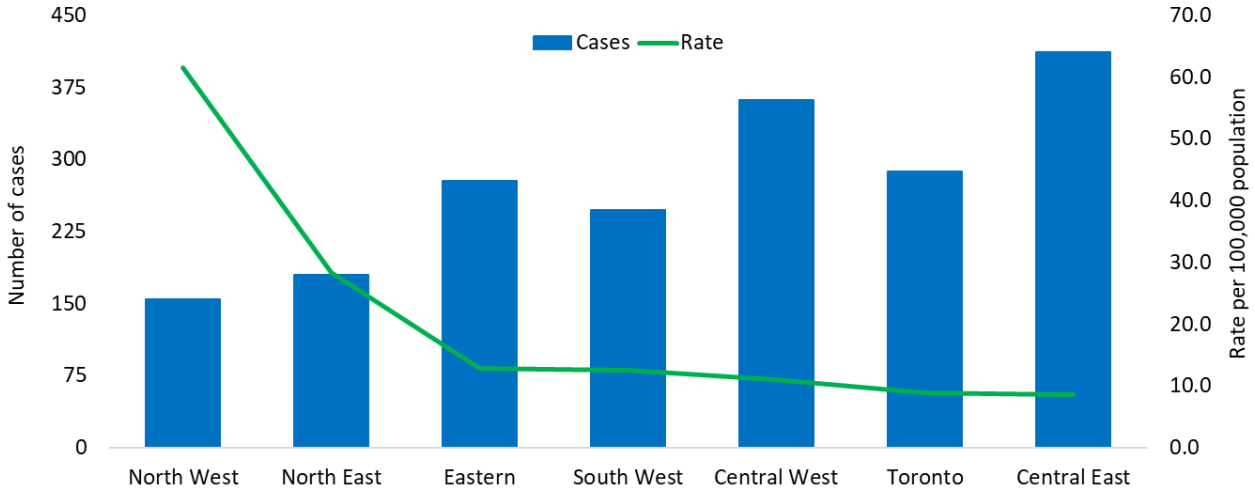
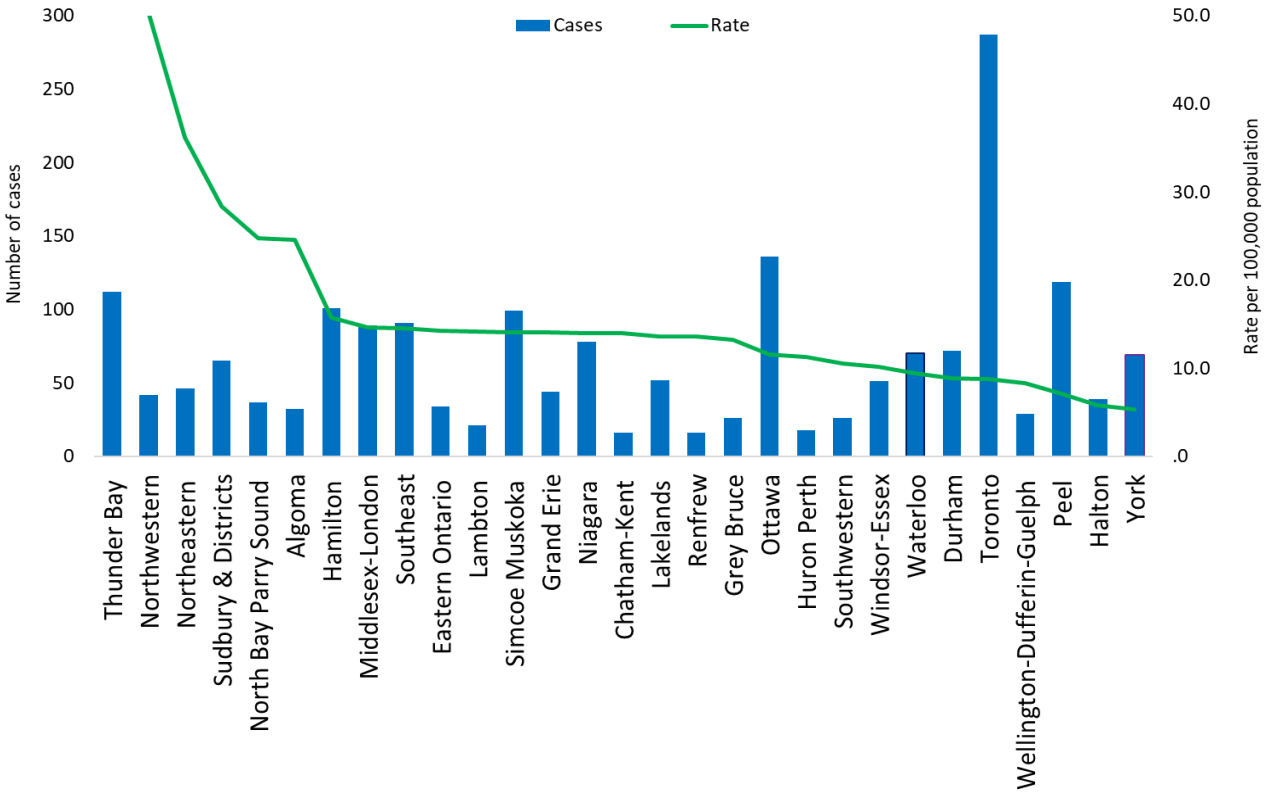


Figure 7: Public Health Unit-Specific* IPD Case Counts and Rates: Ontario, 2025



*Refer to the technical notes section for a complete listing of public health unit names

Technical Notes

Data Sources

Case Data

- The data for this report were based on information entered in the Ontario Ministry of Health (MOH) integrated Public Health Information System (iPHIS) database as of March 4, 2026.
- iPHIS is a dynamic disease reporting system that allows ongoing updates to previously entered data. As a result, data extracted from iPHIS represent a snapshot at the time of extraction and may differ from previous or subsequent reports.

Immunization Data

- In addition to the immunization data from iPHIS, pneumococcal immunization records were also extracted from Ontario's Digital Health Immunization Repository using the Panorama Enhanced Analytical Reporting (PEAR) tool. Data are current as of February 2, 2026.
- The PEAR data extract was linked to the iPHIS data to create a more robust immunization dataset. This linked dataset was used to assess immunization status and to count the number of valid doses a case had received prior to disease onset. For the 2007-2025 surveillance period, this resulted in an additional 1,011 cases with valid immunization records (including an additional 51 cases in 2025).

Ontario Population Data

Ontario population data come from:

- Population estimates 2007-2024: Population Reporting. Population estimates county/municipality, 2001-2024 [data file]. Ottawa ON: Statistics Canada, Government of Canada [producer]; Toronto, ON: Ontario. Ministry of Health, IntelliHealth Ontario [distributor]; [data extracted 2025 Feb 21].
- Population projections 2025: Population Reporting. Population Projections Public Health Unit, 2024-2051 [data file]. Toronto ON: Ministry of Finance [producer]; Toronto, ON: Ontario. Ministry of Health, IntelliHealth Ontario [distributor]; [data extracted 2025 Sep 12].

Data Caveats

- As of 1 January 2025, Ontario moved from 34 to 29 public health units. The reduction is due to several mergers between public health units: Porcupine Health Unit and Timiskaming Health Unit merged to become Northeastern Public Health (NEH); Brant County Health Unit and Haldimand-Norfolk Health Unit merged to become Grand Erie Public Health (GEH); Haliburton, Kawartha, Pine Ridge District Health Unit and Peterborough Public Health merged to become Haliburton Kawartha Northumberland Peterborough Health Unit (HKNP); and Hastings Prince Edward Public Health, Leeds, Grenville & Lanark District Health Unit and Kingston, Frontenac and Lennox & Addington Public Health joined to become South East Health Unit (SEH).
- **List of Ontario Public Health Units:**
  - Algoma=Algoma Public Health (ALG)
  - Chatham-Kent=Chatham-Kent Public Health (CHK)
  - Durham=Durham Region Health Department (DUR)

- Eastern Ontario=Eastern Ontario Health Unit (EOH)
- Grey Bruce=Grey Bruce Public Health (GBO)
- Grand Erie=Grand Erie Public Health (GEH)
- Halton=Halton Region Public Health (HAL)
- Hamilton=City of Hamilton Public Health Services (HAM)
- Lakelands=Lakelands Public Health (HNP)
- Huron Perth=Huron Perth Public Health (HPH)
- Lambton=Lambton Public Health (LAM)
- Middlesex-London=Middlesex-London Health Unit (MSL)
- Northeastern=Northeastern Public Health (NEH)
- Niagara=Niagara Region Public Health (NIA)
- North Bay Parry Sound=North Bay Parry Sound District Health Unit (NPS)
- Northwestern=Northwestern Health Unit (NWR)
- Ottawa=Ottawa Public Health (OTT)
- Southwestern=Southwestern Public Health (OXE)
- Peel=Peel Public Health (PEL)
- Renfrew=Renfrew County and District Health Unit (REN)
- Southeast=Southeast Public Health (SEH)
- Simcoe Muskoka=Simcoe Muskoka District Health Unit (SMD)
- Sudbury & Districts=Public Health Sudbury & Districts (SUD)
- Thunder Bay=Thunder Bay District Health Unit (THB)
- Toronto=Toronto Public Health (TOR)
- Waterloo=Region of Waterloo Public Health and Paramedic Services (WAT)
- Wellington-Dufferin-Guelph=Wellington-Dufferin-Guelph Public Health (WDG)
- Windsor-Essex=Windsor-Essex County Health Unit (WEC)
- York=York Region Public Health (YRK)

- **Data reported for 2020-2021 should be interpreted with caution. Both testing and iPHIS data entry practices were likely impacted by the COVID-19 pandemic response.**
- The five-year non-pandemic average and five-year non-pandemic average plus two standard deviations were used to provide a historical context to IPD cases in Ontario. For IPD, these were based on the years 2018, 2019, 2022, 2023 and 2024. Case counts and rates were greatly reduced during 2020 and 2021 (i.e., the height of the COVID-19 pandemic) and returned to pre-pandemic levels by 2022.
- Only IPD cases meeting the confirmed case classification as listed in the Ontario Ministry of Health surveillance case definitions are included in the reported case counts.[1]

    - Changes to provincial surveillance case definitions and disease classifications have occurred over the years and thus may impact the analysis of trends over time. Cases are classified in iPHIS based on the Ontario Ministry of Health surveillance case definitions in use at the time the case was identified.
    - PHO's technical report "Factors Affecting Reportable Diseases in Ontario: Case Definition Changes and Associated Trends 1991-2016" and its associated appendix provide more detailed information on this topic.[5]
- Cases of IPD are reported based on the Episode Date, which is an estimate of the onset date of disease for a case. In order to determine this date, the following hierarchy exists in iPHIS: Onset Date > Specimen Collection Date > Lab Test Date > Reported Date.
    - For example: If an Onset Date exists, it will be used as the Episode Date. If Onset Date is not available, then the next available date in the hierarchy (i.e., Specimen Collection Date) will be used, and so on.
- Case counts by geography are based on the diagnosing health unit (DHU). DHU refers to the case's public health unit of residence at the time of illness onset or report to public health and not necessarily the location of exposure.
    - Cases for which the DHU was reported as MOHLTC (to signify a case that is not a resident of Ontario) were excluded from this analysis.
- Cases for which the Disposition Status was reported as ENTERED IN ERROR, DOES NOT MEET DEFINITION, DUPLICATE-DO NOT USE, or any variation on these values, were excluded from this analysis.
- Incidence rates were calculated per 100,000 population.
- To determine immunization status of cases, only documented doses of a pneumococcal vaccine product administered at least 14 days prior to disease onset were included. A case marked as unimmunized in iPHIS and without any valid documented dose (in either iPHIS or PEAR) was considered unimmunized. A case without any immunization information entered in iPHIS and no valid immunization history found in PEAR was considered as having an unknown pneumococcal immunization history.
- To be considered as a valid hospitalization, a case must have a hospital admission date that is no more than 60 days prior to disease onset or 90 days post disease onset.
- To be considered as a fatal case outcome, a case must have a death recorded that is not classified as "reportable disease was unrelated to cause of death".

References

1. Ontario. Ministry of Health. Ontario public health standards: requirements for programs, services, and accountability. Infectious disease protocol. Appendix 1: case definitions and disease specific information. Disease: Pneumococcal disease, invasive. Effective: May 2022 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2026 Mar 5]. Available from: https://files.ontario.ca/moh-ophs-pneumococcal-disease-en-2022.pdf
2. Blacklock CB, Weinberger DM, Perniciaro S, Wyllie AL *Streptococcus pneumoniae serotypes*. New Haven, CT: Yale School of Public Health; 2024 [cited 2026 Mar 5]. Available from: https://pneumococcalcapsules.github.io/serotypes/.
3. Ontario. Ministry of Health. Publicly funded immunization schedules for Ontario. Effective: June 2022 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2026 Mar 5]. Available from: https://www.ontario.ca/files/2025-01/moh-publicly-funded-immunization-schedule-en-2025-01-23.pdf
4. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Immunization data tool [Internet]. Toronto, ON: King's Printer for Ontario; 2025 [cited 2026 Mar 5]. Available from: https://www.publichealthontario.ca/en/Data-and-Analysis/Infectious-Disease/Immunization-Tool
5. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Factors affecting reportable diseases in Ontario: case definition changes and associated trends, 1991-2016 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2018 [cited 2026 Mar 5]. Available from: https://www.publichealthontario.ca/-/media/Documents/F/2018/factors-reportable-diseases-ontario-1991-2016.pdf?rev=ff1672e0c3fb410dbf025ec2b4c88f79&sc_lang=en.

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